

Universal Window Times **January 1980 thru December 1980**

HOW TO USE PUBLICATION NO. 229



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The following Universal Window times are based on the specifications outlined in AS-49-12. The European Universal Window is always during positive declination. The start of the window is two hours from the setting moon time in Frankfurt, Germany. The end of the window is when the moon sets at this same location. Keep in mind that Western Europe can still see the moon for another hour, or so, after the moon sets at Frankfurt. Also, the Western Hemisphere can still see the moon for many more hours. Quite often the European and U.S. stations will operate during negative declinations, and just before moonset in Europe, if the times are convenient. There is a good chance for activity on weekends on frequencies from 144.000 to 144.010 MHz.

Also included are the times each month for the new moon. When the moon and sun are at almost the same G.H.A. and declination, the moon cannot be seen because of the visible radiation from the sun. The radio frequency radiation will be sufficient to obliterate any echoes. The more antenna directivity a station has, the closer to the sun it can be used. There is a limit however. With a 160 element collinear on 144 MHz, it is usually possible to operate successfully one day before and one day after new moon.

<u>1980</u>	<u>New Moon</u>	<u>Perigee</u>	<u>Apogee</u>
January	17	20	8
February	16	17	5
March	16	16	3,30
April	15	14	26
May	14	12	24
June	12	9	21
July	12	4,30	19
August	10	27	15
September	9	25	12
October	9	23	9
November	7	21	5
December	7	19	3,30

JANUARY - 1980

Day	UT
1	0358-0558
2	0454-0654
3	0541-0751
4	0622-0822
5	0656-0856
6	0726-0926
7	0752-0952
8	0814-1014
9	0836-1036
22	2000-2200
23	2116-2316
24-25	2230-0030
25-26	2340-0140
27	0048-0248
28	0151-0351
29	0246-0446
30	0336-0536
31	0420-0620

FEBRUARY - 1980

Day	UT
1	0456-0656
2	0526-0726
3	0554-0754
4	0618-0818
5	0642-0842
19	1858-2058
20	2016-2216
21	2130-2330
22-23	2240-0040
23-24	2344-0144
25	0044-0244
26	0144-0344
27	0218-0418
28	0256-0456
29	0329-0529

MARCH - 1980

Day	UT
1	0356-0556
2	0422-0622
3	0446-0646
17	1630-1830
18	1750-1950
19	1910-2110
20	2024-2224
21	2134-2334
22-23	2236-0036
23-24	2332-0132
25	0018-0218
26	0058-0258
27	0132-0332
28	0200-0400
29	0226-0426
30	0250-0450
31	0314-0514

APRIL - 1980

Day	UT
14	1520-1720
15	1641-1841
16	1800-2000
17	1914-2114
18	2024-2224
19	2124-2324
20-21	2216-0016
21-22	2258-0058
22-23	2324-0134
24	0006-0206
25	0032-0232
26	0056-0256
27	0118-0318

MAY - 1980

Day	UT
11	1252-1452
12	1412-1612
13	1532-1732
14	1649-1849
15	1802-2002
16	1908-2108
17	2006-2206
18	2054-2254
19	2134-2334
20-21	2208-0008
21-22	2236-0036
22-23	2302-0102
23-24	2325-0125

JUNE - 1980

Day	UT
8	1152-1352
9	1309-1509
10	1426-1626
11	1540-1740
12	1650-1850
13	1752-1952
14	1846-2046
15	1930-2130
16	2008-2208
17	2038-2238
18	2106-2306
19	2130-2330
20	2152-2352

JULY - 1980

Day	UT
5	0940-1140
6	1056-1256
7	1210-1410
8	1324-1524
9	1434-1634
10	1538-1738
11	1636-1836
12	1724-1924
13	1805-2005
14	1839-2039
15	1907-2107
16	1932-2132
17	1956-2156

AUGUST - 1980

Day	UT
1	0728-0928
2	0845-1045
3	1000-1200
4	1115-1315
5	1225-1425
6	1330-1530
7	1429-1629
8	1519-1719
9	1602-1802
10	1638-1838
11	1709-1909
12	1736-1936
13	1800-2000
14	1821-2021
29	0629-0829
30	0747-0947
31	0904-1104

SEPTEMBER-1980

Day	UT
1	1017-1217
2	1125-1325
3	1225-1425
4	1317-1517
5	1402-1602
6	1440-1640
7	1511-1711
8	1538-1738
9	1603-1803
10	1626-1826
25	0401-0601
26	0523-0723
27	0644-0844
28	0802-1002
29	0914-1114
30	1019-1219

OCTOBER - 1980

Day	UT
1	1116-1316
2	1204-1404
3	1242-1442
4	1315-1515
5	1344-1544
6	1408-1608
7	1430-1630
23	0251-0451
24	0414-0614
25	0536-0736
26	0653-0853
27	0804-1004
28	0908-1108
29	1000-1200
30	1044-1244
31	1119-1319

NOVEMBER - 1980

Day	UT
1	1149-1349
2	1214-1414
3	1238-1438
4	1259-1459
19	0022-0222
20	0142-0342
21	0304-0504
22	0424-0624
23	0540-0740
24	0650-0850
25	0749-0949
26	0840-1040
27	0919-1119
28	0951-1151
29	1019-1219
30	1044-1244

DECEMBER - 1980

Day	UT
1	1105-1305
16-17	2320-0120
18	0038-0238
19	0157-0357
20	0314-0514
21	0427-0627
22	0533-0733
23	0627-0827
24	0714-0914
25	0751-0951
26	0821-1021
27	0847-1047
28	0910-1110
29	0932-1132

FIND THE MOON AND SUN USING PUBLICATION 229

by Joe Reisert W1JR (ex-W1JAA; ex-W6FZJ)

Finding the moon and sun using "Tables of Computed Altitude and Azimuth - H0214" was described in AS49-1 (Ref. 1) and QST (Ref. 2). In some sections of the country this publication is no longer available. It is slowly being replaced by a new version called "Sight Reduction Tables for Marine Navigation, Publication Nr. 229" (ref. 3).

The differences between H0214 and Pub. 229 are subtle but both can be easily used to obtain accurate results. H0214 is easier to use when the declination is constant and multiple points are needed (such as plotting during a schedule). Pub. 229 is preferred when only one heading is needed since multiple bearings will require page changes.

The format of Pub. 229 is different from that of H0214. Each page starts with a different LHA (Local Hour Angle). Zero LHA is located on your meridian. For instance, Boston is approximately 71° west longitude. Thus when the moon has a GHA of 71° it is on the Boston local meridian and the LHA is zero. If the moon is to the east, the LHA is found by subtracting the GHA from your longitude. If the moon is to the west, subtract your longitude from the moon GHA. For example, if the GHA is 61° , your LHA is 10° . Likewise if the GHA is 81° your LHA is still 10° . You must remember whether the moon is east or west of your longitude.

Now, how do we proceed? Let's use the examples in Ref. 1.

GHA 71° Declination $N2^{\circ}$ [These moon data from the Nautical Almanac for year, month, day and time (GMT) in question].

Local coordinates 122°W . Longitude, 36° North Latitude.

Example #1:

1. Subtract GHA from your longitude to find LHA ($122 - 71 = 51^{\circ}$).
Locate the page with 51° , 309° L.H.A. Latitude same name as Declination.
2. Move down the declination column to 2° and then go across this line until you are below the column marked 36° (your latitude). The set of numbers in the Hc column is your local elevation and the set under the Z column is the local azimuth for the moon. In this case the values are $31^{\circ}57.6'$ and 113.7° respectively.

Example #2:

If the GHA in example #1 had been 173° (vice 71°) your local hour angle would still have been 51° ($173 - 122 = 51^{\circ}$) but west of your longitude. Therefore subtract the indicated azimuth from 360° to obtain the true value ($360 - 113.7^{\circ} = 246.3$) or 246.3° . The elevation remains the same.

Example #3:

GHA 181° Declination $S2^{\circ}$ (from Nautical Almanac).

Local coordinates 122°W Longitude, 36° North Latitude.

1. To find the LHA you must subtract your longitude from the GHA since the moon is west of your longitude. Therefore the LHA is 59 ($181 - 122 = 59$).
2. Since the Declination is south (and you are in the northern hemisphere) turn to the page marked "Latitude Contrary Name to Declination LHA59", 301° . Move down the declination column to 2° and across to the column headed 36° . Read the elevation as $23^{\circ}19.4'$ and the azimuth as 111.1° . Since the moon is west you must subtract the azimuth from 360° to

obtain the correct azimuth of 248.9^0 ($360 - 111.1 = 248.9$).

Don't let the use of the H0214 or Pub. 229 frighten you. It actually takes longer to read this write-up than it does to learn to use the tables. Try a few practice examples to become more proficient. After a few trials you'll see how easy it really can be.

Ref:

1. "Use of Tables of Computed Altitude and Azimuth" by Joe Reisert, W6FZJ, Eimac Note AS49-1.
2. "EME Scheduling, When and Where", by J. H. Reisert, W6FZJ, QST, July 1974 pp. 25 - 29.
3. "Sight Reduction Tables for Marine Navigation". Publication Nr. 229, Volume 3 covers latitudes $30 - 45^0$ inclusive. Other volumes are needed for different latitudes. Price is \$9.40 and it is available at many marine supply houses, government book stores or the U. S. Government Book Store, Room G-25, JFK Federal Bldg., Boston, Mass., 02203.

Brian Manns, K3VGX, has supplied the following additional address to obtain Publication 229.

Defense Mapping Agency
Office of Distribution Services
Attn: Code DDCP
6101 McArthur Blvd.
Washington, DC 20315

Ask for "Publication Nr. 229, Vol. 3, Sight Reduction Tables for Marine Navigation". Volume 3 is for latitudes 30^0 through 45^0 inclusive. Make the \$9.40 check payable to the Treasurer of the United States.

CALENDAR FOR THE YEAR 1980

JANUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

FEBRUARY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

MARCH

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

APRIL

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

MAY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUNE

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

JULY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

AUGUST

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

SEPTEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

OCTOBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

NOVEMBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

DECEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

NEW MOON



PERIGEE



APOGEE



UNIVERSAL WINOOW

